

1 FW

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: A. Smith, et al.

Serial No.: 10/800,110

Filed: March 12, 2004

Confirmation No.: 8924

Customer No.: 33123

For: **PROCESS FOR  
DETERMINATION OF  
OPTIMIZED EXPOSURE  
CONDITIONS FOR  
TRANSVERSE DISTORTION  
MAPPING**

Art Unit: Not yet assigned

Examiner: Not yet assigned

### CERTIFICATE OF MAILING PURSUANT TO 37 CFR 1.8

I hereby certify that this correspondence and the attached papers are being deposited with the United States Postal Service with sufficient postage as first class mail on the date indicated below in an envelope addressed to:

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450, on.

7/8/04  
Date

Michelle McLeary  
Signature

### INFORMATION DISCLOSURE STATEMENT IN ACCORDANCE WITH 37 C.F.R. §§ 1.97-1.98

Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Sir:

Because this Information Disclosure Statement is filed prior to receipt of a First Office Action on the merits of the above-captioned application, a fee for filing this statement should not be due. If, however, it is determined that a fee is due, then any fees that may be due in connection with filing this paper may be charged to Deposit Account No. 50-1213.

In accordance with the duty of disclosure imposed by 37 C.F.R. § 1.56 to inform the Patent Office of all material references known by Applicant or Applicants' representative, this Information Disclosure Statement prepared in accordance with 37 C.F.R. §§ 1.97-1.98 is hereby submitted. The Form PTO-1449 (3 pages) is provided herewith for filing in connection with the above cited application. The cited references that comprise issued U.S. patents are not attached, per the Notice of waiver published in the Official Gazette on August 5, 2003. A copy of the non-patent documents are provided, per 37 C.F.R. § 1.98(a)(2).

**U.S. Serial No. 10/800,110**  
**Smith, et al.**  
**Information Disclosure Statement**  
**Page 2**

The document(s) cited on the Form PTO-1449 are in the English language. Hence, in accordance with the requirements of 37 C.F.R. § 1.98, as amended effective March 16, 1992, no further explanation of the listed items is necessary.

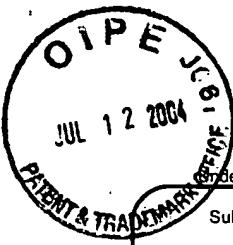
Although these documents and information are made known to the Patent and Trademark Office in compliance with Applicants' duty of disclosure, such disclosure is not to be construed as an admission by Applicants or Applicants' representative that any of the references, singly or in any combination thereof, is effective as prior art against the subject application. In accordance with 37 C.F.R. § 1.97(h), the filing of this Information Disclosure Statement shall not be construed to mean that a search has been made or that no other material information as defined in 37 C.F.R. § 1.56(b) exists.

Applicants respectfully request that the Examiner review the foregoing references and request that they be made of record in the file history of the above-captioned application.

Respectfully submitted,  
**HELLER, EHRMAN, WHITE & McAULIFFE LLP**

By:   
\_\_\_\_\_  
David A. Hall  
Registration No. 32,233

Address all correspondence to:  
**David A. Hall**  
HELLER EHRMAN WHITE & McAULIFFE LLP  
4350 La Jolla Village Dr., 7th Floor  
San Diego, CA 92122-1246  
Telephone: (858) 450-8400  
Facsimile: (858) 450-8499  
EMAIL: [dhall@hewm.com](mailto:dhall@hewm.com)



Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

**Substitute for form 1449/PTO**

## **INFORMATION DISCLOSURE STATEMENT BY APPLICANT**

*(Use as many sheets as necessary)*

Sheet 1 of 5

<b>Complete if Known</b>	
Application Number	10/800,110
Filing Date	March 12, 2004
First Named Inventor	A. Smith
Art Unit	Not yet assigned
Examiner Name	Not yet assigned
Attorney Docket Number	38203-6295

**U. S. PATENT DOCUMENTS**

## FOREIGN PATENT DOCUMENTS

**Examiner Signature** **Date Considered**

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. <sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.

Translation is attached.  
This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO				<b>Complete if Known</b>	
				Application Number	10/800,110
				Filing Date	March 12, 2004
				First Named Inventor	A. Smith
				Art Unit	Not yet assigned
				Examiner Name	Not yet assigned
Sheet	2	of	5	Attorney Docket Number	38203-6295

<b>NON PATENT LITERATURE DOCUMENTS</b>						
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.				<sup>2</sup>
	I	G. Muller, "The Waferstepper Challenge: Innovation and Reliability Despite Complexity", Version 1, pp. 1-11, September 10, 2003.				
	J	"KLA 5105 Overlay Brochure", KLA-Tencor				
	K	H.G. Müller et al., "Large Area Fine Line Patterning by Scanning Projection Lithography", MCM Proceedings, pp. 100-104, 1994.				
	L	J. van Schoot et al., "0.7 NA DUV Step & Scan System for 150nm Imaging with Improved Overlay", SPIE Vol. 3679, pp. 448-456, 1999.				
	M	M.A. van den Brink et al., "Direct-Referencing Automatic Two-Points Reticle-To-Wafer Alignment Using a Projection Column Servo System", SPIE, Optical Microlithography V, Vol.				
	N	A. Erdmann et al., "Influence of Optical Nonlinearities of Photoresists on the Photolithographic Process: Applications", SPIE, Vol. 2726-29, 1996.				
	O	J.H. Bruning, "Optical Lithography - Thirty Years and Three Orders of Magnitude", SPIE, Vol. 3051, pp. 14-27.				
	P	B.E. Newnam et al., "Development of XUV Projection Lithography at 60-80 nm", SPIE, Vol. 1671, pp. 419-436, 1992.				
	Q	J.E. Bjorkholm et al., "Reduction Imaging at 14 nm Using Multilayer-coated Optics: Printing of Features Smaller than 0.1 •m", J. Vac. Sci. Technol. B 8 (6), pp. 1509-1513, 19				
	R	"Quaestor Q7 Brochure", Bio-Rad Semiconductor Systems.				

Examiner Signature		Date Considered	
--------------------	--	-----------------	--

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

1 Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.  
 This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO:  
**Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO				<b>Complete if Known</b>	
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>				<b>Application Number</b>	10/800,110
<i>(Use as many sheets as necessary)</i>				<b>Filing Date</b>	March 12, 2004
				<b>First Named Inventor</b>	A. Smith
				<b>Art Unit</b>	Not yet assigned
				<b>Examiner Name</b>	Not yet assigned
Sheet	3	of	5	<b>Attorney Docket Number</b>	38203-6295

<b>NON PATENT LITERATURE DOCUMENTS</b>					
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.			T <sup>2</sup>
	S	D. MacMillen et al., "Analysis of Image Field Placement Deviations of a 5X Microlithographic Recuction Lens", SPIE Vol. 334, pp. 78-89, 1982.			
	T	G.C. Robins et al., "Experimental Assessment of Pattern and Probe-Based Aberration Monitors", SPIE, Microlithography Proceedings, Vol. 5040-149, pp. 1-12, 2003.			
	U	J. Sung, "Aberration Measurement of Photolithographic Lenses by Use of Hybrid Diffractive Photomasks", Applied Optics, Vol. 42, No. 11, pp. 1987-1995, April 10, 2003.			
	V	International Technology Roadmap for Semiconductors, 2001 Edition", SEMATECH, pp. 1-21.			
	W	F. Schellenberg, "Resolution Enhancement with OPC/PSM", Future Fab International, Vol. 9, 2000.			
	X	I. Pollentier et al., "Thinking Outside the Box for Improved Overlay Metrology", SPIE Microlithography Proceedings, Vol. 5038, pp. 12-16, 2003.			
	Y	R. Martin et al., "Measuring Fab Overlay Programs", SPIE Metr. Inspection, and Process Control for Microlithography, XIII, pp. 64-71, March 1999.			
	Z	R. DeJule, "Mix-and-Match: A Necessary Choice", Semiconductor International, pp. 66-76, February 2000.			
	AA	J. Armitage, "Analysis of Overlay Distortion Patterns", J. Kirk, SPIE, Vol. 921, pp. 207-221, 1988.			
	AB	J. Wyant et al., "Basic Wavefront Aberration Theory for Optical Metrology", ISBN 0-12-408611-X, Chapter 1, pp. 1-53, 1992.			

Examiner Signature		Date Considered	
--------------------	--	-----------------	--

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

1 Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  <i>(Use as many sheets as necessary)</i>				<b>Complete if Known</b>	
				Application Number	10/800,110
				Filing Date	March 12, 2004
				First Named Inventor	A. Smith
				Art Unit	Not yet assigned
				Examiner Name	
Sheet	4	of	5	Attorney Docket Number	38203-6295

NON PATENT LITERATURE DOCUMENTS				
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.		T <sup>2</sup>
	AC	T. Brunner, "Impact of Lens Aberrations on Optical Lithography", IBM, Vol. 41, pp. 1-2, 1997.		
	AD	"TWINSCAN 1100 Product Literature" ASML.		
	AE	C. Ausschnitt, "Distinguishing Dose from Defocus for In-line Lithography Control", SPIE, Vol. 3677, pp. 140-147, 1999.		
	AF	L. Thompson et al., "Introduction to Microlithography", ACS, 2nd Edition, 1994, p. 69.		
	AG	G. Moore, "Cramming More Components Onto Integrated Circuits", Electronics, Vol. 38, No. 8, 1965.		
	AH	P. Rai-Choudhury, "Handbook of Microlithography, Micromachining, and Microfabrication", SPIE Press, Microlithography, Vol. 1, pp. 417, 1997.		
	AI	M.T. Takac et al., "Self-Calibration in Two-Dimensions: The Experiment", SPIE Vol. 2725, pp. 130-146.		
	AJ	M.A. van den Brink et al., "Matching Management of Multiple Wafer Steppers Using a Stable Standard and a Matching Simulator", SPIE Integrated Circuit Metrology, Inspection, an		
	AK	M.R. Raugh, "Error Estimation for Lattice Methods of Stage Self-Calibration", SPIE Vol. 3050, pp. 614-625.		
	AL	T.F. Hasan et al., "Automated Electrical Measurements of Registration Errors in Step-and-Repeat Optical Lithography Systems", IEEE Transactions on Electron Devices, Vol. ED-27		

Examiner Signature		Date Considered	
--------------------	--	-----------------	--

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

1 Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.  
This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO:  
Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO				<b>Complete if Known</b>	
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>				Application Number	10/800,110
<i>(Use as many sheets as necessary)</i>				Filing Date	March 12, 2004
				First Named Inventor	A. Smith
				Art Unit	Not yet assigned
				Examiner Name	Not yet assigned
Sheet	5	of	5	Attorney Docket Number	38203-6295

<b>NON PATENT LITERATURE DOCUMENTS</b>					
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.			T <sup>2</sup>
	AM	C.A. Mack, "Inside PROLITH: A Comprehensive Guide to Optical Lithography Simulation", pp. 137-151.			
	AN	M. Dusa et al., "Comprehensive Focus-Overlay-CD Correlation to Identify Photolithographic Performance", SPIE Vol. 2726, pp. 545-554.			
	AO	A.J. de Ruyter et al., "Examples of Illumination Source Effects on Imaging Performance", Arch Chemicals Microlithography Symposium, pp. 1-8, September 22, 2003.			

Examiner Signature		Date Considered	
--------------------	--	-----------------	--

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

1 Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.  
 This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO:  
**Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.